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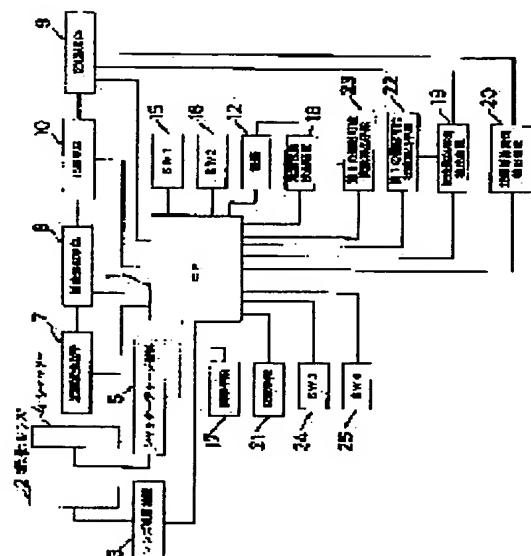
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(54) DIGITAL CAMERA, CONTROL METHOD, AND STORAGE MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a digital camera, a control method, and a storage medium which accurately inform a user of the number of actually photographable pictures, which is determined by the remaining capacities of a recording medium and a battery and enable a user to easily confirm the classification of the recording medium set to the camera and enable the user to surely perform his or her desired photographing.

SOLUTION: This camera is provided with a power source capacity detection means 18, a recording medium capacity detection means 19 which detects the remaining capacity of the recording medium, a setting means 21 which sets the information volume per photographed picture, a first allowed photograph number calculation means 22 which calculates the number of photographs which can be recorded in the recording medium 9 in accordance with the remaining capacity of the recording medium and the information volume per photographed picture, a second allowed photograph number calculation means 23 which calculates the number of pictures which can be photographed with the same power source in accordance with the power required for one photograph which is preliminarily obtained by the capacity of the power source detected by the means 18 and the information volume per photographed picture, and a display means 17 which displays at least one of first and second allowed photograph numbers of sheets.



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CLAIMS

[Claim(s)]

[Claim 1]A digital camera comprising:

A power-supply detection means to detect capacity of a power supply.

A recording-medium capacity detection means which detects remaining capacity of a recording medium.

A setting-out means to set up the amount of information per taken image.

The 1st number-of-sheets calculating means that computes the 1st number of sheets recordable on a recording medium from the amount of information per [which remaining capacity and a setting-out means of a recording medium detected by a recording-medium capacity detection means set up] taken image that can be photoed and that can be photoed.

The 2nd number-of-sheets calculating means that computes the 2nd number of sheets that can be photoed with the same power supply, and that can be photoed from electric power more nearly required for photography of one sheet for which it has asked beforehand than capacity of a power supply which said power-supply detection means detected, and the amount of information per [which said setting-out means set up] taken image and that can be photoed.

A displaying means which displays at least one side among said 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed.

[Claim 2]comparing said 1st number of sheets that can be photoed with the 2nd number of sheets that can be photoed, and making few directions into the 3rd number of sheets that can be photoed -- this -- the digital camera according to claim 1 establishing a displaying means which displays the 3rd number of sheets that can be photoed.

[Claim 3]The digital camera according to claim 2 giving an indication a display style which distinguished and differed by case where said 3rd number of sheets that can be photoed is said 1st number of sheets that can be photoed, and a case where said 3rd number of sheets that can be photoed is said 2nd number of sheets that can be photoed.

[Claim 4]When a power-supply detection means has a directing means which directs capacity detection of a power supply, display information of a displaying means usually displays the 1st number of sheets that can be photoed and said directing means is operated, a power-supply detection means detects capacity of a power supply, and the 2nd number-of-sheets calculating means that can be photoed computes the 2nd number of sheets that can be photoed -- this -- the digital camera according to claim 1 indicating the 2nd number of sheets that can be photoed by fixed time at said displaying means.

[Claim 5]A digital camera comprising:

A recording-medium kind detection means to detect a kind of recording medium with which this camera is equipped.

A displaying means which displays a detection result of this recording-medium kind detection means.

[Claim 6]The digital camera according to claim 5 even when said displaying means is [a main power supply switch] OFF, wherein it displays a detection result of said recording-medium kind detection means.

[Claim 7]The digital camera according to claim 5, wherein said recording-medium kind detection means detects a kind of this recording medium when said main power supply switch is OFF and a recording medium is changed, and said displaying means displays a detection result of said recording-medium kind detection means.

[Claim 8]A setting-out means to have several recording modes from which the amount of recorded information per taken image differs, and to set up this recording mode.

A recording-medium capacity detection means which detects remaining capacity of a recording medium.

A number-of-sheets calculating means which computes number of sheets recordable on a recording medium which can be photoed from a recording mode which remaining capacity and a setting-out means of a recording medium which this recording-medium capacity detection means detected set up and which can be photoed.

A displaying means which displays said number of sheets which can be photoed.

Are the digital camera provided with the above, and also when a main power supply switch is OFF, said setting-out means, It is possible to set up a recording mode, when a main power supply switch is OFF and a recording mode is set up by said setting-out means, said number-of-sheets calculating means which can be photoed computes number of sheets which can be photoed, and said displaying means displays said number of sheets which can be photoed.

[Claim 9]The digital camera according to claim 8, wherein said setting-out means is a photographing mode setting means which sets up simultaneously one photographing mode used for photography out of two or more

photographing modes which specify said recording mode, and a recording mode corresponding to it.

[Claim 10]The digital camera according to claim 8, wherein said two or more recording modes differ in a compression ratio, respectively.

[Claim 11]The digital camera according to claim 8, wherein said two or more recording modes differ in a pixel number of a picture, respectively.

[Claim 12]The digital camera according to claim 8, wherein said two or more recording modes differ in a compression ratio and a pixel number of a picture, respectively.

[Claim 13]A step which is the control method of a digital camera and detects capacity of a power supply, A step which detects remaining capacity of a recording medium, and a step which sets up the amount of information per taken image, A step which computes the 1st number of sheets recordable on a recording medium from remaining capacity of said recording medium, and the amount of information per [said / which was set up] taken image that can be photoed, A step which computes the 2nd number of sheets that can be photoed with the same power supply, and that can be photoed from electric power more nearly required for photography of one sheet for which it has asked beforehand than the amount of information per [which capacity and said setting-out means of said detected power supply set up] taken image, A step which displays at least one side among said 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed, furthermore — comparing said 1st number of sheets that can be photoed with the 2nd number of sheets that can be photoed, and making few directions into the 3rd number of sheets that can be photoed — this — with a step which displays the 3rd number of sheets that can be photoed. By case where said 3rd number of sheets that can be photoed is said 1st number of sheets that can be photoed, and a case where said 3rd number of sheets that can be photoed is said 2nd number of sheets that can be photoed. When it has a step which gives an indication a display style which distinguished and differed, and a step which directs capacity detection of a power supply in said power-supply detecting step and succeeds in said operation to direct, detect capacity of a power supply, and. a step which computes the 2nd number of sheets that can be photoed — this — with a step which indicates the 2nd number of sheets that can be photoed by fixed time. A step which detects and displays a kind of recording medium with which a camera body is equipped, When a step which displays this detection result even when a main power supply switch is OFF, and a main power supply switch are OFF and a recording medium is changed, A step which detects a kind of said recording medium and displays said detection result, A step which has several recording modes from which the amount of recorded information per taken image differs, and sets up this recording mode, A step which computes number of sheets recordable on a recording medium which can be photoed from a step which detects remaining capacity of a recording medium, and remaining capacity and said set-up recording mode of a detected recording medium, In a control method of a digital camera provided with a step etc. which display said number of sheets which can be photoed, When it is possible to set up a recording mode also when said main power supply switch is OFF, a main power supply switch is OFF and a recording mode is set up by said setting-out means, Said two or more recording modes have again two or more photographing modes as which said recording mode is specified to each recording mode corresponding to a step which computes number of sheets which can be photoed and displays said number of sheets which can be photoed. A control method containing a step etc. which set up simultaneously one photographing mode used for photography out of two or more of such photographing modes, and a recording mode corresponding to it.

[Claim 14]A storage storing a program for realizing a control method according to claim 13.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the digital camera which records the image data of a still picture on a recording medium, and operates it in details more about a digital camera.

[0002]

[Description of the Prior Art] A digital camera as what displays the number of sheets recordable on a recording medium which can be photoed, ** Display the ratio of a recordable residue to the absolute magnitude of a recordable residue and the recordable total capacity of a recording medium which are known by JP,5-2210958,A, It is publicly known for there to be a proposal which displays a recordable residue in case the amount of information per taken image differs, and to display the remaining capacity of a cell still more nearly again.

[0003] Although image data is recorded on recording media, such as a magnetic recording medium and semiconductor memory, and is operated in a digital camera, that from which these recording media are identical shape, and a kind differs exists, and the digital camera can respond to these various kinds of recording media. There are the following as a proposal about the recording medium used for these digital cameras. That is, it is detecting the kind of recording medium of ** JP,5-21958,A, and displaying a recordable residue, and detecting and displaying the existence of the recording medium of ** JP,6-6742,A etc.

[0004]

[Problem(s) to be Solved by the Invention] Although <1> cell capacity remains, the recordable residue of a recording medium is lost and it becomes impossible to photo it, when it becomes impossible for a user to use and photo a digital camera.

[0005] Although remained, the remaining capacity of a cell is lost and it becomes impossible to photo the recordable residue of <2> recording media.

[0006] ** is mentioned.

[0007] A user has a desire to combine the two above-mentioned cases and know the actual number of sheets which can be photoed.

[0008] However, in a conventional proposal like the above-mentioned ** case, even if the remaining capacity of a cell can know a user, he cannot know the number of sheets of the remaining capacity which can be photoed.

[0009] In the conventional example, when one [main power], the amount of information per taken image is set up, and the record residue is displayed. therefore, the machinery which the structure of a final controlling element of setting up the amount of information per sheet can set up even when one [main power] -- in the case of a structural final controlling element, there was a fault as which a record residue is not displayed even if it changes setting out of the amount of information per sheet, when one [main power].

[0010] If a recording medium differs in a kind, the characteristics differ, for example, semiconductor memory needs electric power only at the time of record reproduction, and there is little power consumption, but the record reproduction of data takes a long time. On the other hand, the magnetic recording medium of a hard disk needs continuous power, and needs the still bigger electric power at the time of record reproduction. Therefore, although a photographing interval may be long, even if there is much consumption of a cell, for the user who wants to shorten a photographing interval, the hard disk type magnetic recording medium is suitable [there is little power consumption and semiconductor memory is suitable for the user who wants to lessen consumption of a cell, and]. If the recording medium in which the user made a mistake is used, the photography which he desires becomes impossible, and in using a digital camera, the user checks easily the kind of recording medium with which the camera is equipped.

[0011] However, in the proposal of above-mentioned **, since the kind of recording medium is detected and the recordable residue is displayed, there is no display of the kind of detected recording medium, and the user cannot check easily the kind of recording medium with which the camera is equipped. In the proposal of above-mentioned **, since the existence of a recording medium is detected and displayed, there is no display of the kind of recording medium also in this case, and a user has SUBJECT of ** that the kind of recording medium with which the camera is equipped cannot be checked easily.

[0012] A user is correctly told about the actual number of sheets which accomplished this invention in view of the above-mentioned situation, and is decided from the remaining capacity of a recording medium, and the remaining capacity of a cell and which can be photoed, It aims at providing the digital camera, the control

method, and storage which can realize that a user can check easily the kind of recording medium with which the camera is equipped, and it can perform certainly taking [which the user itself wishes] etc.

[0013]

[Means for Solving the Problem] This invention can solve an aforementioned problem by having the following composition.

[0014](1) A power-supply detection means to detect capacity of a power supply in a digital camera, A recording-medium capacity detection means which detects remaining capacity of a recording medium, and a setting-out means to set up the amount of information per taken image, The 1st number-of-sheets calculating means that computes the 1st number of sheets recordable on a recording medium from the amount of information per [which remaining capacity and a setting-out means of a recording medium detected by a recording-medium capacity detection means set up] taken image that can be photoed and that can be photoed, From electric power more nearly required for photography of one sheet for which it has asked beforehand than capacity of a power supply which said power-supply detection means detected, and the amount of information per [which said setting-out means set up] taken image. A digital camera establishing the 2nd number-of-sheets calculating means that computes the 2nd number of sheets that can be photoed with the same power supply, and that can be photoed, and that can be photoed, and a displaying means which displays at least one side among said 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed.

[0015](2) comparing said 1st number of sheets that can be photoed with the 2nd number of sheets that can be photoed, and making few directions into the 3rd number of sheets that can be photoed -- this -- a digital camera given in the preceding clause (1) establishing a displaying means which displays the 3rd number of sheets that can be photoed.

[0016](3) A digital camera given in the preceding clause (2) giving an indication a display style which distinguished and differed by case where said number of sheets which is the 3rd, and which can be photoed is said 1st number of sheets that can be photoed, and a case where said 3rd number of sheets that can be photoed is said 2nd number of sheets that can be photoed.

[0017](4) When a power-supply detection means has a directing means which directs capacity detection of a power supply, display information of a displaying means usually displays the 1st number of sheets that can be photoed and said directing means is operated, a power-supply detection means detects capacity of a power supply, and, the 2nd number-of-sheets calculating means that can be photoed computes the 2nd number of sheets that can be photoed -- this -- a digital camera given in the preceding clause (1) indicating the 2nd number of sheets that can be photoed by fixed time at said displaying means.

[0018](5) A digital camera having a recording-medium kind detection means to detect a kind of recording medium with which this camera is equipped in a digital camera, and a displaying means which displays a detection result of this recording-medium kind detection means.

[0019](6) A digital camera given in the preceding clause (5) even when said displaying means is [a main power supply switch] OFF, wherein it displays a detection result of said recording-medium kind detection means.

[0020](7) A digital camera given in the preceding clause (5) when said main power supply switch is OFF and a recording medium is changed, wherein it detects a kind of this recording medium and, as for said recording-medium kind detection means, said displaying means displays a detection result of said recording-medium kind detection means.

[0021](8) A setting-out means to have several recording modes from which the amount of recorded information per taken image differs, and to set up this recording mode, From a recording mode which a recording-medium capacity detection means which detects remaining capacity of a recording medium, and remaining capacity and a setting-out means of a recording medium which this recording-medium capacity detection means detected set up. In a digital camera provided with a number-of-sheets calculating means which computes number of sheets recordable on a recording medium which can be photoed and which can be photoed, and a displaying means which displays said number of sheets which can be photoed, When said setting-out means can set up a recording mode also when a main power supply switch is OFF, a main power supply switch is OFF and a recording mode is set up by said setting-out means, A digital camera, wherein said number-of-sheets calculating means which can be photoed computes number of sheets which can be photoed and said displaying means displays said number of sheets which can be photoed.

[0022](9) said -- setting out -- a means -- said -- a recording mode -- specifying -- plurality -- photographing mode -- inside -- from -- photography -- using -- one -- a ** -- photographing mode -- and -- it -- corresponding -- a recording mode -- simultaneous -- setting up -- a photographing mode setting means -- it

is -- things -- the feature -- carrying out -- the preceding clause -- (-- eight --) -- a statement -- a digital camera .

[0023](10) A digital camera given in the preceding clause (8), wherein said two or more recording modes differ in a compression ratio, respectively.

[0024](11) A digital camera given in the preceding clause (8), wherein said two or more recording modes differ in a pixel number of a picture, respectively.

[0025](12) A digital camera given in the preceding clause (8), wherein said two or more recording modes differ in a compression ratio and a pixel number of a picture, respectively.

[0026](13) A step which is the control method of a digital camera and detects capacity of a power supply, A step which detects remaining capacity of a recording medium, and a step which sets up the amount of information per taken image, A step which computes the 1st number of sheets recordable on a recording medium from remaining capacity of said recording medium, and the amount of information per [said / which was set up] taken image that can be photoed, A step which computes the 2nd number of sheets that can be photoed with the same power supply, and that can be photoed from electric power more nearly required for photography of one sheet for which it has asked beforehand than the amount of information per [which capacity and said setting-out means of said detected power supply set up] taken image, A step which displays at least one side among said 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed, furthermore -- comparing said 1st number of sheets that can be photoed with the 2nd number of sheets that can be photoed, and making few directions into the 3rd number of sheets that can be photoed -- this -- with a step which displays the 3rd number of sheets that can be photoed. By case where said 3rd number of sheets that can be photoed is said 1st number of sheets that can be photoed, and a case where said 3rd number of sheets that can be photoed is said 2nd number of sheets that can be photoed. When it has a step which gives an indication a display style which distinguished and differed, and a step which directs capacity detection of a power supply in said power-supply detecting step and succeeds in said operation to direct, detect capacity of a power supply, and. a step which computes the 2nd number of sheets that can be photoed -- this -- with a step which indicates the 2nd number of sheets that can be photoed by fixed time. A step which detects and displays a kind of recording medium with which a camera body is equipped, When a step which displays this detection result even when a main power supply switch is OFF, and a main power supply switch are OFF and a recording medium is changed, A step which detects a kind of said recording medium and displays said detection result, A step which has several recording modes from which the amount of recorded information per taken image differs, and sets up this recording mode, A step which computes number of sheets recordable on a recording medium which can be photoed from a step which detects remaining capacity of a recording medium, and remaining capacity and said set-up recording mode of a detected recording medium, In a control method of a digital camera provided with a step etc. which display said number of sheets which can be photoed, When it is possible to set up a recording mode also when said main power supply switch is OFF, a main power supply switch is OFF and a recording mode is set up by said setting-out means, Said two or more recording modes have again two or more photographing modes as which said recording mode is specified to each recording mode corresponding to a step which computes number of sheets which can be photoed and displays said number of sheets which can be photoed. A control method containing a step etc. which set up simultaneously one photographing mode used for photography out of two or more of such photographing modes, and a recording mode corresponding to it.

[0027](14) A storage storing a program for realizing a control method of a statement in the preceding clause (13).

[0028]

[Embodiment of the Invention]The 1 embodiment of this invention is described below.

[0029]The block diagram and drawing 2 in which the example of important section composition of the digital camera which requires drawing 1 for this invention is shown, The flow chart of the display subroutine of the digital camera in this example and drawing 3, The flow chart of the photographing sequence of the digital camera in this example and drawing 4, Setting out or the flow chart which shows a procedure when carrying out a setting variation, and drawing 5 the amount of information per taken image using the setting-out means in this example, The flow chart and drawing 6 in which a procedure when changing a recording medium in this example is shown, The explanatory view in which the flow chart which shows a procedure when operating a power-supply pilot switch in this example and checking a power supply, and drawing 7 show a segment display example, the explanatory view in which drawing 8 shows a power-supply display example, and drawing 9 are the explanatory

views showing the segment display example in other examples.

[0030](Example 1) In drawing 1, a taking lens and 3 are lens drives, CPU and 2 by which 1 controls the whole digital camera operate the taking lens 2 with the output of an unillustrated focus detecting device, and they perform a focus. 4 is a shutter, 5 is a shutter charge mechanism, it consists of unillustrated a motor, drive mechanism, etc., and the shutter 4 is charged. 7 is an optoelectric transducer which consists of CCD etc., and changes into a picture signal the object image by which image formation was carried out with the taking lens 2. 8 is an image processing means, carries out various processings to the picture signal of the optoelectric transducer 7, and changes them into image data. 9 is a recording medium which records image data, and comprises camera built-in or a removable magnetic recording medium, semiconductor memory, etc. 10 is a recording device and records image data on the recording medium 9. 12 is a power supply of a cell etc. 15 is a switch which forms SW1 and starts photographing preparation operation, 16 is a release switch which forms SW2, and 25 is a main power supply switch which forms SW4.

[0031]Although mentioned later, even if it is a case where the main power supply switch 25 which forms SW4 is OFF, electric power is supplied so that some functions may work. 17 is a displaying means which consists of liquid crystal displays etc., and displays various information on a taken image and a camera. Even when the main power supply switch 25 which forms SW4 is OFF, the displaying means 17 continues a display and is performed. 18 is a power-supply detection means (device), and detects the capacity of the power supply 12 of a cell etc. 19 is a recording-medium capacity detection means (device), and detects the remaining capacity of the recording medium 9. 20 is a recording-medium kind detection means (device), and detects the kind of recording medium 9.

[0032]The digital camera of this example has several recording modes from which the amount of recorded information per taken image differs, and the recording mode of these plurality differs in a compression ratio and/or the pixel number of a picture. 21 is a setting-out means and sets up the amount of information per [said] sheet, or said recording mode. The ratio of the amount of information per [which the remaining capacity and the setting-out means 21 of the recording medium 9 which 22 is the 1st number-of-sheets calculating means that can be photoed, and the recording-medium capacity detection means (device) 19 detected set up] sheet, Or the 1st number of sheets recordable on the recording medium 9 from the ratio of the amount of information per [which corresponded to said recording mode and was decided beforehand] sheet that can be photoed is computed. The amount of information per [which the capacity and the setting-out means 21 of the power supply 12 which 23 is the 2nd number-of-sheets calculating means that can be photoed, and the power-supply detection means (device) 18 detected set up] sheet, Or the 2nd number of sheets that can be photoed with the same power supply 12 and that can be photoed is computed from electric power required for the amount of information per [which corresponded to said recording mode and was decided beforehand] sheet, and the photography of one sheet for which it has asked beforehand. If one [the power-supply pilot switch 24 which 24 is a power-supply pilot switch which forms SW3, and forms this SW3], the power-supply detection means 18 will detect the capacity of the power supply 12.

[0033]Drawing 2 is a flow chart of the display subroutine of the digital camera in this example, and explains the example of a display subroutine of operation with reference to drawing 2.

[0034]First, at Step S1, the power-supply sensing device 18 detects the capacity of the power supply 12, and it at Step S2. The recording-medium kind sensing device 20 detects the kind of recording medium 9, and it at Step S3. The recording-medium capacity sensing device 19 detects the remaining capacity of the recording medium 9, and it by step S4. The remaining capacity of the recording medium 9 which the recording-medium capacity sensing device 19 detected in the 1st number-of-sheets calculating means 22 that can be photoed, A ratio with the amount of information per [which is set up by the setting-out means 21] taken image, Or the 1st number of sheets M that is photography number of sheets recordable on the recording medium 9 by setting out of the amount of information per [by the setting-out means 21] taken image and that can be photoed is computed from a ratio with the amount of information per [which corresponded to the recording mode and was decided beforehand] sheet. The amount of information per [which the capacity and the setting-out means 21 of the power supply 12 which the power-supply sensing device 18 detected in the 2nd number-of-sheets calculating means 23 that can be photoed set up at Step S5] taken image, From a ratio with power consumption required for the photography of one sheet defined beforehand. Or the 2nd number of sheets N that can be photoed with the power supply 12 and that can be photoed is computed by setting out of the amount of information per [by the setting-out means 21] taken image from power consumption required for the photography of one sheet beforehand determined as the amount of information per [which corresponded to the recording mode and was decided beforehand] sheet.

[0035]At Step S6, if it is $M > N$ which judges the size of the 1st number of sheets M that can be photoed, and the 2nd number of sheets N that can be photoed, and it is $M < N$, it progresses to Step S7 to step S9.

[0036]At Step S7, the 3rd number of sheets L that is number of sheets with little the 1st number of sheets M that can be photoed and the 2nd number of sheets N that can be photoed and that can be photoed is set to N. At Step S8, said 3rd number of sheets L that can be photoed is set to M. By step S9, the displaying means 17 displays various information on cameras, such as a power supply, a storage kind, the 1st number of sheets that can be photoed, the 2nd number of sheets that can be photoed, and the 3rd number of sheets that can be photoed, if needed, and ends operation.

[0037]Even when the main power supply switch 25 which forms SW4 is OFF, this subroutine is performed and a display is performed.

[0038]Drawing 3 is a flow chart of the photographing sequence of the digital camera in this example. With reference to the flow chart of drawing 3, the sequence at the time of the photography in this example is explained.

[0039]One [Step S101 / the photographing-preparation-operation start switch 15 which forms SW1] is judged, if it is YES, it progresses to Step S102, and if it is NO, it returns to Step S101. an unillustrated focus detecting device performs focus detection at Step S102. The lens drive 3 operates the taking lens 2 based on the output of an unillustrated focus detecting device at Step S103, and a focus is performed. One [the release switch 16 which forms SW2 at Step S104] is judged. If it is YES, it progresses to Step S105, and if it is NO, it returns to Step S104. SHATA 4 is opened at Step S105, and at Step S106, the optoelectric transducer 7 changes into a picture signal the object image by which image formation was carried out with the taking lens 2, and captures an image. After closing SHATA 4 at Step S107 and closing SHATA 4, the SHATA charge mechanism 5 charges SHATA 4. Subsequently, processing to the picture signal of the optoelectric transducer 7 with various image processing means 8 is performed at Step S108, and image processing changed into image data is performed. The recording device 10 records image data on the recording medium 9 at Step S109. The displaying means 17 changes image data into a video signal at Step S110, and a taken image is displayed. And it progresses to a display subroutine at Step S111.

[0040]Using the setting-out means in this example, drawing 4 is setting out or a flow chart which shows a procedure when carrying out a setting variation, and explains the amount of information per taken image below with reference to this flow chart.

[0041]Step S201 -- the setting-out means 21 -- the amount of information per taken image -- setting out -- or a setting variation is carried out. It progresses to a display subroutine at the following step S202.

[0042]The setting-out means 21 can be set up even when the main power supply switch 25 which forms SW4 is OFF, and a sequence is performed, and a display is performed.

[0043]Drawing 5 is a flow chart which shows a procedure when changing a recording medium in this example, and explains a sequence when changing the recording medium 9 into below.

[0044]A user exchanges the recording medium 9 stored by the unillustrated recording-medium storage device at Step S301. It progresses to a display subroutine at Step S302.

[0045]The user is possible for exchanging the recording medium 9 stored by the unillustrated recording-medium storage device even when the main power supply switch 25 which forms SW4 is OFF, and a sequence is performed and a display is performed.

[0046]It operates a power-supply pilot switch in this example, and drawing 6 is a flow chart which shows a procedure when checking a power supply, and below, a user operates power-supply pilot-switch SW3, and it explains a sequence when checking a power supply.

[0047]One [Step S401 / the power-supply pilot switch 24 which forms SW3] is judged. If it is YES, it progresses to Step S402, and if it is NO, it returns to Step S401. It progresses to a display subroutine at Step S402.

[0048]The user can operate the power-supply pilot switch 24 which forms SW3, even when the main power supply switch 25 which forms SW4 is OFF, and a sequence is performed and a display is performed.

[0049]Drawing 7 is an explanatory view in which showing a segment display example in the case of Example 1 of the displaying means 17, and, in the case of a figure, it is a figure showing the state where all the segments were displayed for explanation. In practice, only a required segment is displayed.

[0050]Among a figure, since it is the same as that of what was shown above which attached the same numerals, explanation is omitted.

[0051]In a figure, 49 is a taken image indicator and 50 is a power-supply indicator. C whose A; capacity of the

power-supply indicator 50 is sufficient according to the capacity of the power supply 12 which the power-supply sensing device 18 detected as shown in drawing 8 and whose B; capacity is below half; capacity displays three states of ** which is 0. 51 is a recording-medium kind indicator and enables wearing of two kinds, a hard disk and a CF card, with the camera of this example, When the recording-medium kind sensing device 20 detects that the recording medium 9 stored by the unillustrated recording-medium storage device is a hard disk, When "HDD" is displayed as shown in 52 in a figure, and it detects that it is a DF card, as shown in 53 in a figure, "CF" is displayed, and when no unillustrated recording-medium storage devices are detected in the sky, no recording-medium kind indicators 51 are displayed.

[0052]54 is the 1st number-of-sheets display that comprises the seven segment element child of triple figures and that can be photoed, and displays the computed result of the 1st number-of-sheets calculating means 22 that can be photoed. 55 is the 2nd number-of-sheets display that comprises the seven segment element child of triple figures and that can be photoed, and displays the computed result of the 2nd number-of-sheets calculating means 23 that can be photoed.

[0053]The displaying means 17 are the above composition, and if a display command comes out from CPU1 according to the state of a camera, they will display a taken image, a power supply, a recording-medium kind, the 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed.

[0054]Drawing 9 is a figure showing the 2nd and 3rd example of the displaying means 17. The figure expresses the state where all the segments were displayed, for explanation, and displays only a required segment in practice.

[0055](Example 2) In Example 2, the numerals 56 in drawing 9 are the 3rd number-of-sheets display that comprises the seven segment element child of triple figures and that can be photoed, and display the 3rd number of sheets that was explained with the above-mentioned flow chart and that can be photoed. When the 3rd number of sheets that can be photoed is the 1st number of sheets that can be photoed, a display is turned on, and when the 3rd number of sheets that can be photoed is the 2nd number of sheets that can be photoed, it has composition which blinks a display. According to this example, a user can know by which the number of sheets which can be photoed shall be restricted between the recording medium 9 and the power supply 12, and can exchange which of the recording medium 9 and the power supply 12, or the more suitable one if needed.

[0056](Example 3) In Example 3, the numerals 56 in drawing 9 are the number-of-sheets displays which comprise the seven segment element child of triple figures and which can be photoed, and display the 1st number of sheets that was usually explained with the above-mentioned flow chart and that can be photoed. And when a user operates the power-supply pilot switch 24 which forms SW3 and checks a power supply, according to the flow chart shown in said drawing 6, the 2nd number of sheets that can be photoed is indicated by fixed time, and the 1st number of sheets that can be photoed is displayed again after that. According to this example, the user can know the 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed if needed.

[0057]Above, the displaying means of Examples 2 and 3 is small compared with the displaying means of Example 1, and can miniaturize the whole camera.

[0058]If it adds, two or more photographing modes as which the above-mentioned recording mode is specified with the digital camera of a conventional type corresponding to each mode are provided, Said setting-out means 21 may constitute the amount of information per [corresponding to one photographing mode and it which are actually used for photography out of said two or more photographing modes] sheet from a photographing mode setting means set up simultaneously.

[0059]

[Effect of the Invention]A power-supply detection means to detect the capacity of a power supply in the digital camera by the invention of claim 1, The recording-medium capacity detection means which detects the remaining capacity of a recording medium, and a setting-out means to set up the amount of information per taken image, The 1st number-of-sheets calculating means that computes the 1st number of sheets recordable on a recording medium from the amount of information per [which the remaining capacity and the setting-out means of the recording medium detected by the recording-medium capacity detection means set up] taken image that can be photoed and that can be photoed, From electric power more nearly required for the photography of one sheet for which it has asked beforehand than the capacity of the power supply which said power-supply detection means detected, and the amount of information per [which said setting-out means set up] taken image. The 2nd number-of-sheets calculating means that computes the 2nd number of sheets that can be photoed with the same power supply, and that can be photoed and that can be photoed, and the

displaying means which displays at least one side among said 1st number of sheets that can be photoed, and the 2nd number of sheets that can be photoed were established.

[0060]comparing said 1st number of sheets that can be photoed with the 2nd number of sheets that can be photoed, and making few directions into the 3rd number of sheets that can be photoed in the digital camera by the invention of claim 2, -- this -- having established the displaying means which displays the 3rd number of sheets that can be photoed.

[0061]In the digital camera by the invention of claim 3, an indication was given the display style which distinguished and differed by the case where said 3rd number of sheets that can be photoed is said 1st number of sheets that can be photoed, and the case where said 3rd number of sheets that can be photoed is said 2nd number of sheets that can be photoed.

[0062]In the digital camera by the invention of claim 4, a power-supply detection means, When it has a directing means which directs capacity detection of a power supply, the display information of a displaying means usually displays the 1st number of sheets that can be photoed and said directing means is operated, a power-supply detection means detects the capacity of a power supply, and. the 2nd number-of-sheets calculating means that can be photoed computes the 2nd number of sheets that can be photoed -- this -- indicate the 2nd number of sheets that can be photoed by fixed time at said displaying means.

[0063]It is effective in telling a user about the actual number of sheets which is decided from the remaining capacity of a recording medium, and the remaining capacity of a cell and which can be photoed correctly by composition of **.

[0064]Have a recording-medium kind detection means to detect the kind of recording medium with which this camera is equipped, and a displaying means which displays the detection result of this recording-medium kind detection means in the invention of claim 5.

[0065]In the invention of claim 6, said displaying means should display the detection result of said recording-medium kind detection means, even when a main power supply switch is OFF.

[0066]In the invention of claim 7, when said main power supply switch is OFF and said recording-medium kind detection means changes a recording medium, detect the kind of this recording medium and said displaying means should display the detection result of said recording-medium kind detection means.

[0067]***** and a user can check easily the kind of recording medium with which the camera is equipped, and it is effective in the ability to perform photography which the user itself desires.

[0068]A setting-out means to have several recording modes from which the amount of recorded information per taken image differs in the invention of claim 8, and to set up this recording mode, From the recording mode which the recording-medium capacity detection means which detects the remaining capacity of a recording medium, and the remaining capacity and the setting-out means of the recording medium which this recording-medium capacity detection means detected set up. In a digital camera provided with the number-of-sheets calculating means which computes the number of sheets recordable on a recording medium which can be photoed and which can be photoed, and the displaying means which displays said number of sheets which can be photoed, When said setting-out means can set up a recording mode also when a main power supply switch is OFF, a main power supply switch is OFF and a recording mode is set up by said setting-out means, Said number-of-sheets calculating means which can be photoed should compute the number of sheets which can be photoed, and said displaying means should display said number of sheets which can be photoed.

[0069]In the invention of claim 9, said setting-out means should be a photographing mode setting means which sets up simultaneously one photographing mode used for photography out of two or more photographing modes which specify said recording mode, and the recording mode corresponding to it.

[0070]The effect that the whole camera can be miniaturized by the ability of ***** and a displaying means to be made small is presented.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The block diagram showing the example of important section composition of the digital camera concerning this invention

[Drawing 2]The flow chart of the display subroutine of the digital camera in this example

[Drawing 3]The flow chart of the photographing sequence of the digital camera in this example

[Drawing 4]The flow chart which shows setting out or a procedure when carrying out a setting variation for the amount of information per taken image using the setting-out means in this example

[Drawing 5]The flow chart which shows a procedure when changing a recording medium in this example

[Drawing 6]The flow chart which shows a procedure when operating a power-supply pilot switch in this example and checking a power supply

[Drawing 7]The explanatory view showing a segment display example

[Drawing 8]The explanatory view showing a power-supply display example

[Drawing 9]The explanatory view showing the segment display example in other examples

[Description of Notations]

- 1 CPU which controls the whole digital camera
- 2 Taking lens
- 3 Lens drive
- 4 Shutter
- 5 Shutter charge mechanism
- 7 Optoelectric transducer
- 8 Image processing means
- 9 Recording medium
- 10 Recording device
- 12 Power supply
- 15 Photographing-preparation-operation start switch SW1
- 16 Release switch SW2
- 17 Displaying means
- 18 Power-supply detection means
- 19 Recording-medium capacity detection means
- 20 Recording-medium kind detection means
- 21 Setting-out means
- 22 The 1st number-of-sheets calculating means that can be photoed
- 23 The 2nd number-of-sheets calculating means that can be photoed
- 24 Power-supply pilot-switch SW3
- 25 Main power supply switch SW4

[Translation done.]

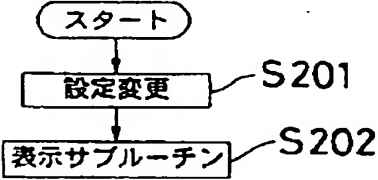
* NOTICES *

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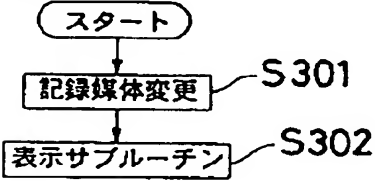
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DRAWINGS

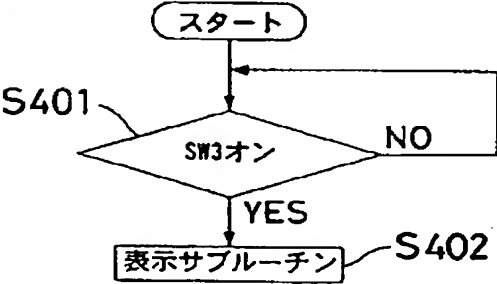
[Drawing 4]



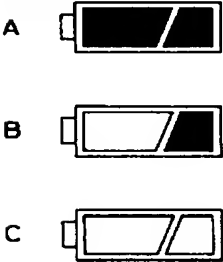
[Drawing 5]



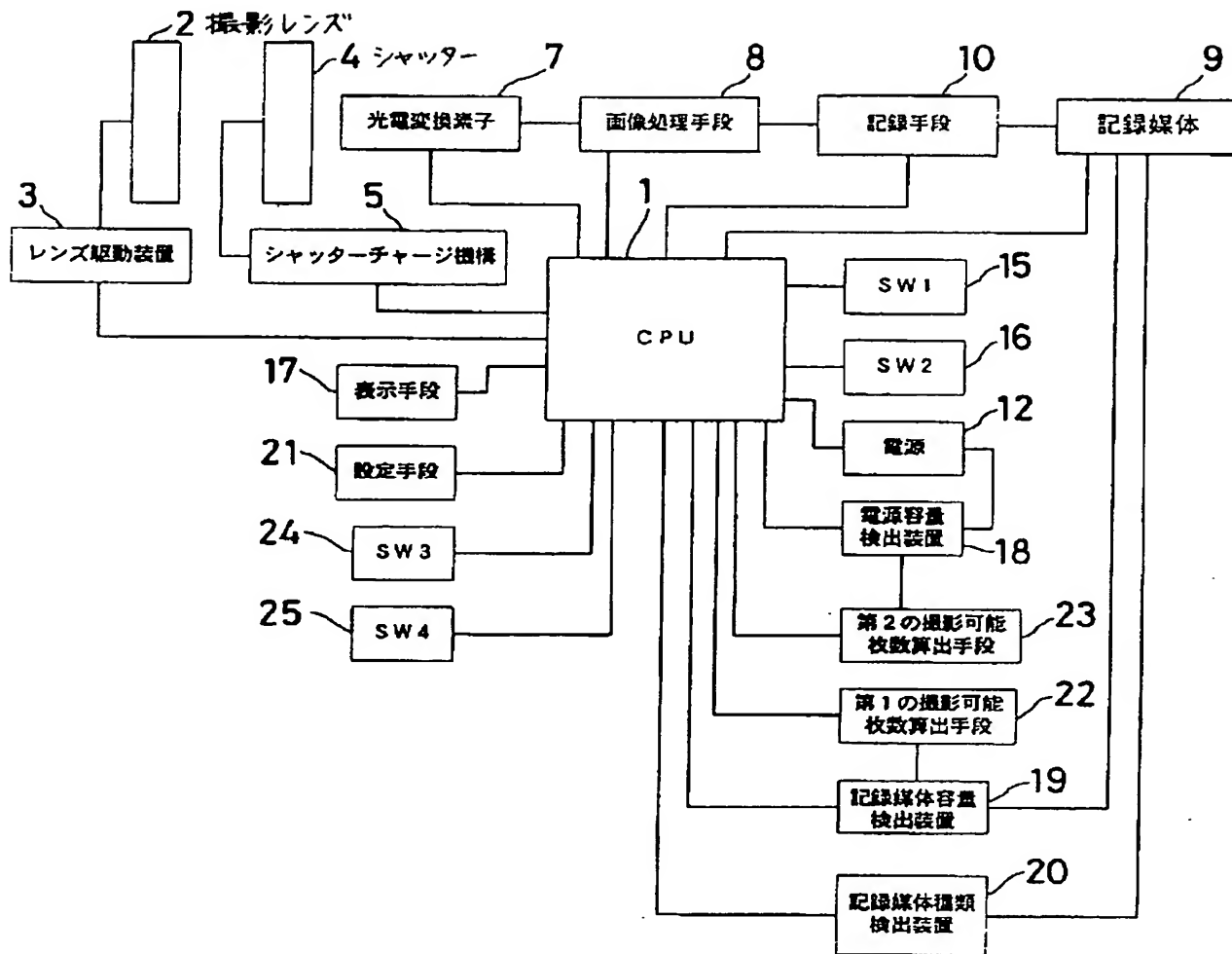
[Drawing 6]



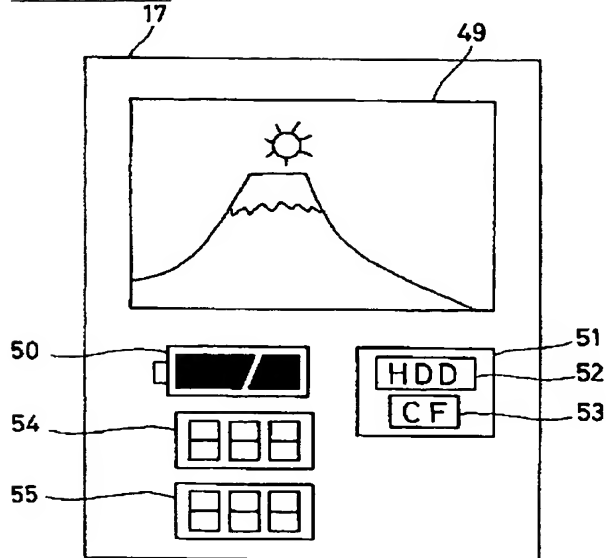
[Drawing 8]



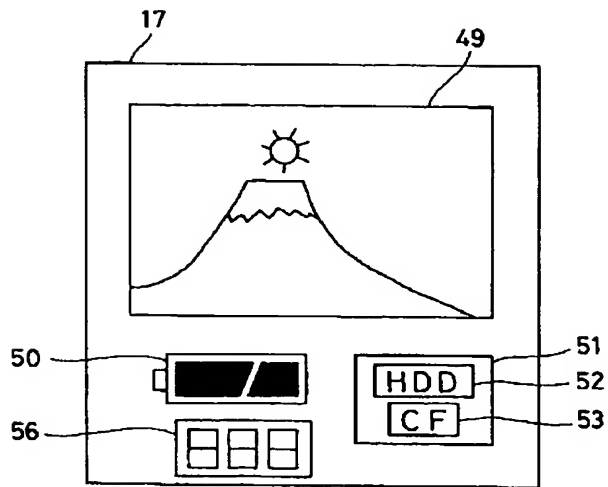
[Drawing 1]



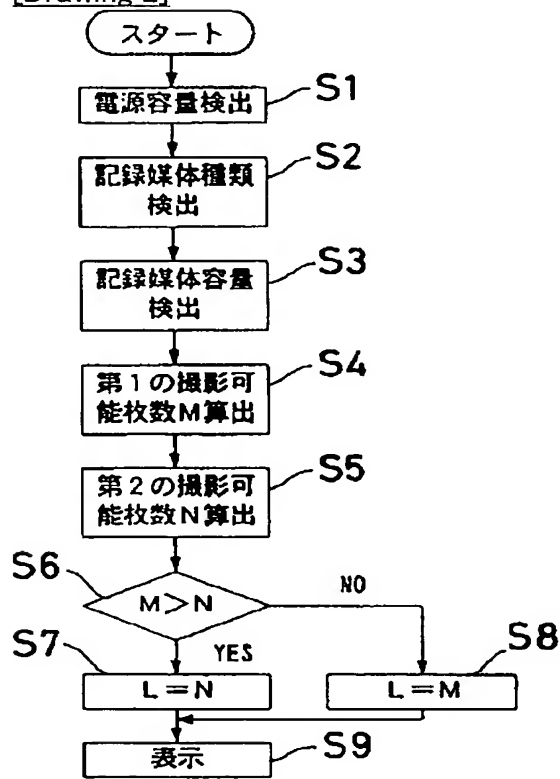
[Drawing 7]



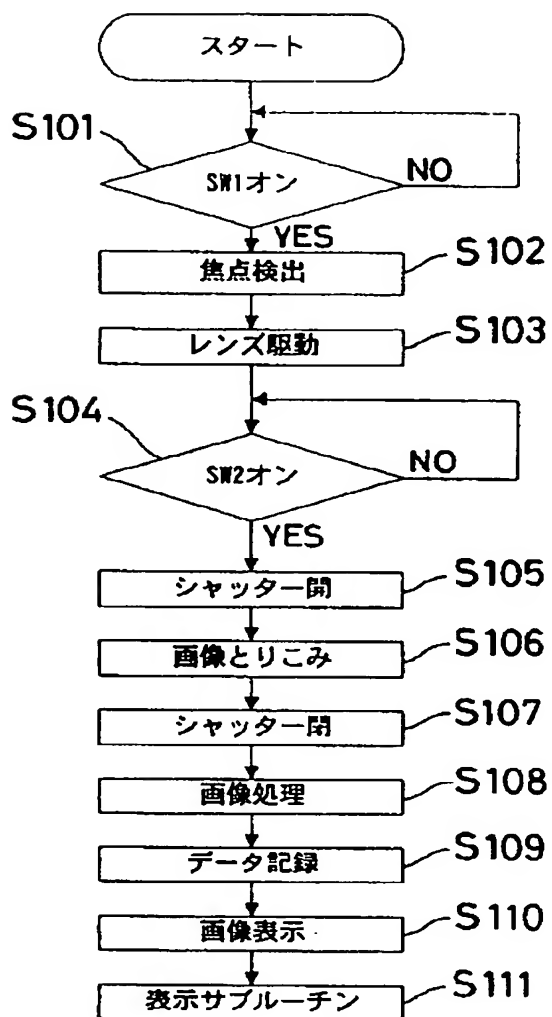
[Drawing 9]



[Drawing 2]



[Drawing 3]



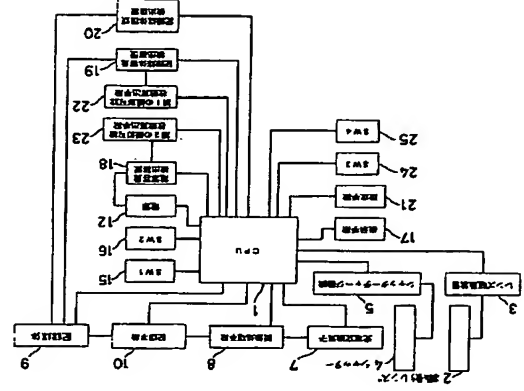
[Translation done.]

【請求項1】 デジタルカメラにおいて、電源の容量を
検出する電源容量検出手段と、記録媒体の残り容量を検
出する記録媒体容量検出手段と、撮影画像1枚当たりの
情報量を設定する設定手段と、記録媒体容量検出手段で
検出した記録媒体の残り容量と設定手段が設定した撮影
画像1枚当たりの情報量から記録媒体に記録可能な第1
の撮影可能枚数を算出する第1の撮影可能枚数算出手段
と、前記電源容量検出手段が検出した電源の容量、及び
前記設定手段が設定した撮影画像1枚当たりの情報量よ
り求めらるる1枚の撮影に必要な電力から、同一電
源で撮影できる第2の撮影可能枚数を算出する第2の撮
影可能枚数算出手段と、前記第1の撮影可能枚数及び第
2の撮影可能枚数の内、少なくとも一方を表示する表示
手段とを設けたことを特徴とするデジタルカメラ。
【請求項2】 前記第1の撮影可能枚数と第2の撮影可
能枚数とを比較し、少ない方を第3の撮影可能枚数と
し、該第3の撮影可能枚数を表示する表示手段とを設け
たことを特徴とする請求項1記載のデジタルカメラ。
【請求項3】 前記第3の撮影可能枚数が、前記第1の
撮影可能枚数である場合と、前記第3の撮影可能枚数
が、前記第2の撮影可能枚数である場合とで、表示を区
別して異なった表示形態としたことを特徴とする請求項
2記載のデジタルカメラ。
【請求項4】 電源容量検出手段は、電源の容量検出を
指示する指示手段を有し、表示手段の表示内容は通常は
第1の撮影可能枚数を表示し、前記指示手段が操作され
た時に、電源容量検出手段が電源の容量を検出すると共
に、第2の撮影可能枚数算出手段が第2の撮影可能枚数
を算出し、該第2の撮影可能枚数を前記表示手段に一定
時間表示することを特徴とする請求項1記載のデジタル
カメラ。
【請求項5】 デジタルカメラにおいて、該カメラに装
着されている記録媒体の種類を検出する記録媒体種類検
出手段と、該記録媒体種類検出手段の検出結果を表示す
る表示手段とを有することを特徴とするデジタルカメ
ラ。
【請求項6】 前記表示手段は、メイン電源スイッチが
オフの時でも、前記記録媒体種類検出手段の検出結果を
表示することを特徴とする請求項5記載のデジタルカメ
ラ。
【請求項7】 前記記録媒体種類検出手段は、前記メイ
ン電源スイッチがオフの時に記録媒体を変更した場合に
は、この記録媒体の種類を検出し、前記表示手段が前記
記録媒体種類検出手段の検出結果を表示することを特徴
とする請求項5記載のデジタルカメラ。
【請求項8】 撮影画像1枚当たりの記録情報量が異な
る複数の記録モードを有し、該記録モードを設定する設
定手段と、記録媒体の残り容量を検出する記録媒体容量
検出手段と、該記録媒体容量検出手段が検出した記録媒

体の残り容量及び設定手段が設定した記録モードから、
記録媒体に記録可能な撮影可能枚数を算出する撮影可能
枚数算出手段と、前記撮影可能枚数を表示する表示手段
とを備えるデジタルカメラにおいて、前記設定手段はメ
イン電源スイッチがオフの時も、記録モードを設定する
ことが可能であり、メイン電源スイッチがオフの時に前
記設定手段により記録モードが設定された時は、前記撮
影可能枚数算出手段が撮影可能枚数を算出し、前記表示
手段が前記撮影可能枚数を表示することを特徴とするデ
ジタルカメラ。
【請求項9】 前記設定手段は、前記記録モードを指定
する複数の撮影モードの中から撮影に用いる一つの撮影
モード及びそれに対応する記録モードを同時に設定する
撮影モード設定手段であることを特徴とする請求項8記
載のデジタルカメラ。
【請求項10】 前記複数の記録モードは、夫々圧縮率
が異なることを特徴とする請求項8記載のデジタルカメ
ラ。
【請求項11】 前記複数の記録モードは、夫々画像の
画素数が異なることを特徴とする請求項8記載のデジタ
ルカメラ。
【請求項12】 前記複数の記録モードは、夫々圧縮率
及び画像の画素数が異なることを特徴とする請求項8記
載のデジタルカメラ。
【請求項13】 デジタルカメラの制御方法であって、
電源の容量を検出するステップと、記録媒体の残り容量
を検出するステップと、撮影画像1枚当たりの情報量を
設定するステップと、前記記録媒体の残り容量及び前記
設定した撮影画像1枚当たりの情報量から記録媒体に記
録可能な第1の撮影可能枚数を算出するステップと、前
記検出された電源の容量及び前記設定手段が設定した撮
影画像1枚当たりの情報量より求めらるる1枚の撮
影に必要な電力から、同一電源で撮影できる第2の撮影
可能枚数を算出するステップと、前記第1の撮影可能枚
数及び第2の撮影可能枚数の内、少なくとも一方を表示
するステップと、更に、前記第1の撮影可能枚数と第2
の撮影可能枚数とを比較して少ない方を第3の撮影可能
枚数とし、該第3の撮影可能枚数を表示するステップ
と、前記第3の撮影可能枚数が前記第1の撮影可能枚数
である場合と、前記第3の撮影可能枚数が前記第2の撮
影可能枚数である場合とで、表示を区別して異なった表
示形態とするステップと、前記電源容量検出ステップに
おいて、電源の容量検出を指示するステップを有し、前
記指示する操作がなされた時に、電源の容量を検出する
と共に、第2の撮影可能枚数を算出するステップと、該
第2の撮影可能枚数を一定時間表示するステップと、ま
た、カメラ本体に装着されている記録媒体の種類を検出
し表示するステップと、メイン電源スイッチがオフの時
でも、該検出結果を表示するステップと、メイン電源ス
イッチがオフの時に記録媒体を変更した場合には、前記

(19)日本国特許庁 (J P)		(12) 公開特許公報 (A)		(11)特許出願公開番号 特開2001-78061 (P2001-78061A)	
				(43)公開日 平成13年3月23日(2001.3.23)	
(51)Int.Cl.	識別記号	F I	フ-I-D' (参考)		
H 0 4 N 5/225		H 0 4 N 5/225	A 2 H 1 0 2		
G 0 3 B 17/18		G 0 3 B 17/18	F 5 C 0 2 2		
H 0 4 N 5/765		H 0 4 N 5/781	Z		
	5/781		5 1 0 M		
		審査請求 未請求 請求項の数14 OL (全 10 頁)			
(21)出願番号	特願平11-248760	(71)出願人	000001007 キヤノン株式会社		
(22)出願日	平成11年9月2日(1999.9.2)	(72)発明者	東京都大田区下丸子3丁目30番2号 西尾 哲也		
		(74)代理人	東京都大田区下丸子3丁目30番2号 キヤ ノン株式会社内 100069061		
		Fターム(参考)	弁理士 丹羽 宏之 (外1名) 2H102 A471 A474 A801 5C022 A413 A827 A840 A16 A042 AC52 AC59 AC73 AC80		

(54)【発明の名称】 デジタルカメラ及び制御方法並びに記録媒体



(57)【要約】
【課題】 記録媒体及び電池の残容量から決まる実際の
撮影可能枚数を正確にユーザに知らせ、且つユーザがカ
メラに装着されている記録媒体の種類を容易に確認する
ことが出来、ユーザ自身の希望する撮影が確実に出来る
こと等を実現可能なデジタルカメラ及び制御方法並びに
記録媒体の提供。
【解決手段】 電源容量検出手段18と、記録媒体の残
り容量を検出する記録媒体容量検出手段19と、撮影画
像1枚当たりの情報量を設定する設定手段21と、前記
記録媒体の残り容量と前記撮影画像1枚当たりの情報量
から記録媒体9に記録可能な第1の撮影可能枚数算出手
段22と、前記電源容量検出手段18が検出した電源の
容量、及び前記撮影画像1枚当たりの情報量より求め
らるる1枚の撮影に必要な電力から、同一電源で撮影
できる第2の撮影可能枚数算出手段23と、前記第1の
撮影可能枚数及び第2の撮影可能枚数の内、少なくとも
一方を表示する表示手段17とを設けたことを特徴とす
る。

2を形成するレリーズスイッチであり、2.5はSW4を形成するメイン電源スイッチであり、

【0031】なお、後述するが、SW4を形成するメイン電源スイッチ2.5がオフの場合であっても、機つかの機能が働くように電力が供給されるようになっている。1.7は液晶ディスプレイ等からなる表示手段であり、撮影画像及びカメラの様々な情報を表示するようにしている。なお、表示手段1.7はSW4を形成するメイン電源スイッチ2.5がオフの場合でも表示を継続して行う。1.8は電源容量検出手段（装置）であり、電池等の電源1.2の容量を検出する。1.9は記録媒体容量検出手段（装置）であり、記録媒体9の残り容量を検出する。2.0は記録媒体種類検出手段（装置）であり、記録媒体9の種類を検出する。

【0032】本実施例のデジタルカメラは、撮影画像1枚当たりの記録情報量が異なる複数の記録モードを有し、これら複数の記録モードは圧縮率及び/または画像の画素数異なるものである。2.1は設定手段であり、前記1枚当たりの情報量、または前記記録モードを設定する。2.2は第1の撮影可能枚数検出手段であり、記録媒体容量検出手段（装置）1.9が検出した記録媒体9の残り容量と設定手段2.1が設定した1枚当たりの情報量、または前記記録モードに対応し且つ予め決められた1枚当たりの情報量の比から記録媒体9に記録可能な第1の撮影可能枚数を算出する。2.3は第2の撮影可能枚数検出手段であり、電源容量検出手段（装置）1.8が検出した電源1.2の容量と設定手段2.1が設定した1枚当たりの情報量、または前記記録モードに対応し且つ予め決められた1枚当たりの情報量と、予め求めてある1枚の撮影に必要な電力から、同一電源1.2で撮影できる第2の撮影可能枚数を算出する。2.4はSW3を形成する電源容量検出手スイッチ2.4がオンすると、電源容量検出手段1.8が電源1.2の容量を検出する。

【0033】図2は、本実施例におけるデジタルカメラの表示サブルーチンのフローチャートであり、図2を参照して表示サブルーチンの動作例を説明する。【0034】先ず、ステップS1で、電源容量検出手段1.8が電源1.2の容量を検出し、ステップS2で、記録媒体種類検出手段2.0が記録媒体9の種類を検出し、ステップS3で、記録媒体容量検出手段1.9が記録媒体9の残り容量を検出し、ステップS4で、第1の撮影可能枚数算出手段2.2が、記録媒体容量検出手段1.9が検出した記録媒体9の残り容量と、設定手段2.1により設定されている撮影画像1枚当たりの情報量との比、または、記録モードに対応し且つ予め決められた1枚当たりの情報量と、設定手段2.1により設定されている撮影画像1枚当たりの情報量とを比較し、第1の撮影可能枚数を算出する。ステップS5で、第2の撮影可能枚数算出手段2.3が、電源容量検

出手段1.8が検出した電源1.2の容量と設定手段2.1が設定した1枚当たりの情報量とを比較し、第2の撮影可能枚数を算出する。2.3は第2の撮影可能枚数算出手段であり、電源容量検出手段（装置）1.8が検出した電源1.2の容量と設定手段2.1が設定した1枚当たりの情報量、または前記記録モードに対応し且つ予め決められた1枚当たりの情報量と、予め求めてある1枚の撮影に必要な電力から、同一電源1.2で撮影できる第2の撮影可能枚数を算出する。2.4はSW3を形成する電源容量検出手スイッチ2.4がオンすると、電源容量検出手段1.8が電源1.2の容量を検出する。

【0033】図2は、本実施例におけるデジタルカメラの表示サブルーチンのフローチャートであり、図2を参照して表示サブルーチンの動作例を説明する。【0034】先ず、ステップS1で、電源容量検出手段1.8が電源1.2の容量を検出し、ステップS2で、記録媒体種類検出手段2.0が記録媒体9の種類を検出し、ステップS3で、記録媒体容量検出手段1.9が記録媒体9の残り容量を検出し、ステップS4で、第1の撮影可能枚数算出手段2.2が、記録媒体容量検出手段1.9が検出した記録媒体9の残り容量と、設定手段2.1により設定されている撮影画像1枚当たりの情報量との比、または、記録モードに対応し且つ予め決められた1枚当たりの情報量と、設定手段2.1により設定されている撮影画像1枚当たりの情報量とを比較し、第1の撮影可能枚数を算出する。ステップS5で、第2の撮影可能枚数算出手段2.3が、電源容量検

出手段1.8が検出した電源1.2の容量と設定手段2.1が設定した1枚当たりの情報量とを比較し、第2の撮影可能枚数を算出する。2.3は第2の撮影可能枚数算出手段であり、電源容量検出手段（装置）1.8が検出した電源1.2の容量と設定手段2.1が設定した1枚当たりの情報量、または前記記録モードに対応し且つ予め決められた1枚当たりの情報量と、予め求めてある1枚の撮影に必要な電力から、同一電源1.2で撮影できる第2の撮影可能枚数を算出する。2.4はSW3を形成する電源容量検出手スイッチ2.4がオンすると、電源容量検出手段1.8が電源1.2の容量を検出する。

【0030】（実施例1）図1において、1は、デジタルカメラ全体を制御するCPU、2は撮影レンズ、3はレンズ駆動装置であり、不図示の焦点検出装置の出力により撮影レンズ2を操作して焦点調節を行う。4はシャッター、5はシャッターチャージ機構であり、不図示のモータ及び駆動機構等からなり、シャッター4をチャージする。7はCCD等からなる光電変換素子であり、撮影レンズ2で結像された被写体像を画像信号に変換する。8は画像処理手段であり、光電変換素子7の画像信号に様々な処理を行い、画像データを交換する。9は画像データを記録する記録媒体であり、カメラ内蔵、或は着脱可能な磁気記録装置や、半導体メモリ等から成る。10は記録手段であり、画像データを記録媒体9に記録する。1.2は電池等の電源である。1.5はSW1を形成し撮影準備動作を開始するスイッチであり、1.6はSW

2を形成するレリーズスイッチであり、2.5はSW4を形成するメイン電源スイッチであり、

【0041】ステップS201で設定手段2.1により撮影画像1枚当たりの情報量を設定、または設定変更する。次のステップS202で表示サブルーチンへ進む。【0042】なお、設定手段2.1は、SW4を形成するメイン電源スイッチ2.5がオフの場合でも設定可能であり、且つシャッタースは実行され表示が行われる。【0043】図5は、本実施例において記録媒体を変更する時の手順を示すフローチャートであり、以下に記録媒体9を変更する時のシーケンスを説明する。

【0044】ステップS301でユーザーが不図示の記録媒体収納装置に収納されている記録媒体9を交換する。ステップS302で表示サブルーチンへ進む。【0045】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でも不図示の記録媒体収納装置に収納されている記録媒体9を交換することは可能であり、且つシャッタースは実行され表示が行われる。【0046】図6は、本実施例において電源容量検出手スイッチを操作し、電源容量を確認する時の手順を示すフローチャートであり、以下にユーザが電源容量検出手スイッチSW3を操作し、電源容量を確認する時のシーケンスを説明する。

【0047】ステップS401で、SW3を形成する電源容量検出手スイッチ2.4がオンしたかを判断する。YESならステップS402へ進み、NOならステップS401へ戻る。ステップS402で表示サブルーチンへ進む。【0048】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でもSW3を形成する電源容量検出手スイッチ2.4を操作することが可能であり、且つシャッタースは実行され表示が行われる。【0049】図7は、表示手段1.7の実施例1の場合で、セグメント表示例を示す説明図であり、図の場合は説明のために全セグメントを表示させた状態を表した図である。実際は必要なセグメントのみを表示する。【0050】図中、同一の符号を付したものは、前に示したものと同様であるので説明を省略する。

【0051】図において、4.9は撮影画像表示部、5.0は電源容量表示部である。電源容量表示部5.0は、図8に示すように電源容量検出手段1.8が検出した電源1.2の容量に応じて、A：容量が十分である、B：容量が半分以下である、C：容量が0である、の3つの状態を表す。5.1は記録媒体種類表示部である。本実施例のカメラではハードディスクとCFカードの二種類を装着可能とし、記録媒体種類検出手段2.0が不図示の記録媒体収納装置に収納されている記録媒体9がハードディスクであることを検出した時は、図中5.2に示すように“CF”を表示し、不図示の記録媒体収納装置が空で何も検出されない時は記録媒体種類表示部5.1は何も表示しない。

【0041】ステップS201で設定手段2.1により撮影画像1枚当たりの情報量を設定、または設定変更する。次のステップS202で表示サブルーチンへ進む。【0042】なお、設定手段2.1は、SW4を形成するメイン電源スイッチ2.5がオフの場合でも設定可能であり、且つシャッタースは実行され表示が行われる。【0043】図5は、本実施例において記録媒体を変更する時の手順を示すフローチャートであり、以下に記録媒体9を変更する時のシーケンスを説明する。

【0044】ステップS301でユーザーが不図示の記録媒体収納装置に収納されている記録媒体9を交換する。ステップS302で表示サブルーチンへ進む。【0045】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でも不図示の記録媒体収納装置に収納されている記録媒体9を交換することは可能であり、且つシャッタースは実行され表示が行われる。【0046】図6は、本実施例において電源容量検出手スイッチを操作し、電源容量を確認する時の手順を示すフローチャートであり、以下にユーザが電源容量検出手スイッチSW3を操作し、電源容量を確認する時のシーケンスを説明する。

【0047】ステップS401で、SW3を形成する電源容量検出手スイッチ2.4がオンしたかを判断する。YESならステップS402へ進み、NOならステップS401へ戻る。ステップS402で表示サブルーチンへ進む。【0048】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でもSW3を形成する電源容量検出手スイッチ2.4を操作することが可能であり、且つシャッタースは実行され表示が行われる。【0049】図7は、表示手段1.7の実施例1の場合で、セグメント表示例を示す説明図であり、図の場合は説明のために全セグメントを表示させた状態を表した図である。実際は必要なセグメントのみを表示する。【0050】図中、同一の符号を付したものは、前に示したものと同様であるので説明を省略する。

【0051】図において、4.9は撮影画像表示部、5.0は電源容量表示部である。電源容量表示部5.0は、図8に示すように電源容量検出手段1.8が検出した電源1.2の容量に応じて、A：容量が十分である、B：容量が半分以下である、C：容量が0である、の3つの状態を表す。5.1は記録媒体種類表示部である。本実施例のカメラではハードディスクとCFカードの二種類を装着可能とし、記録媒体種類検出手段2.0が不図示の記録媒体収納装置に収納されている記録媒体9がハードディスクであることを検出した時は、図中5.2に示すように“CF”を表示し、不図示の記録媒体収納装置が空で何も検出されない時は記録媒体種類表示部5.1は何も表示しない。

【0041】ステップS201で設定手段2.1により撮影画像1枚当たりの情報量を設定、または設定変更する。次のステップS202で表示サブルーチンへ進む。【0042】なお、設定手段2.1は、SW4を形成するメイン電源スイッチ2.5がオフの場合でも設定可能であり、且つシャッタースは実行され表示が行われる。【0043】図5は、本実施例において記録媒体を変更する時の手順を示すフローチャートであり、以下に記録媒体9を変更する時のシーケンスを説明する。

【0044】ステップS301でユーザーが不図示の記録媒体収納装置に収納されている記録媒体9を交換する。ステップS302で表示サブルーチンへ進む。【0045】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でも不図示の記録媒体収納装置に収納されている記録媒体9を交換することは可能であり、且つシャッタースは実行され表示が行われる。【0046】図6は、本実施例において電源容量検出手スイッチを操作し、電源容量を確認する時の手順を示すフローチャートであり、以下にユーザが電源容量検出手スイッチSW3を操作し、電源容量を確認する時のシーケンスを説明する。

【0047】ステップS401で、SW3を形成する電源容量検出手スイッチ2.4がオンしたかを判断する。YESならステップS402へ進み、NOならステップS401へ戻る。ステップS402で表示サブルーチンへ進む。【0048】ユーザは、SW4を形成するメイン電源スイッチ2.5がオフの場合でもSW3を形成する電源容量検出手スイッチ2.4を操作することが可能であり、且つシャッタースは実行され表示が行われる。【0049】図7は、表示手段1.7の実施例1の場合で、セグメント表示例を示す説明図であり、図の場合は説明のために全セグメントを表示させた状態を表した図である。実際は必要なセグメントのみを表示する。【0050】図中、同一の符号を付したものは、前に示したものと同様であるので説明を省略する。

【0052】54は三桁のセブンセグメント素子から成る第1の撮影可能枚数表示で、第1の撮影可能枚数算出手段22の算出結果を表示する。55は三桁のセブンセグメント素子から成る第2の撮影可能枚数表示で、第2の撮影可能枚数算出手段23の算出結果を表示する。

【0053】表示手段17は以上のような構成であり、カメラの状態によりCPU1から、表示指令が出ると、撮影画像、電源容量、記録媒体種類、第1の撮影可能枚数、及び第2の撮影可能枚数を表示する。

【0054】図9は、表示手段17の第2、第3の実施例を示す図である。図は説明のために全セグメントを示させた状態を表しており、実際は必要なセグメントのみを表示する。

【0055】(実施例2) 実施例2において、図9中の符号56は、三桁のセブンセグメント素子から成る第3の撮影可能枚数表示で、前述のフローチャートで説明した第3の撮影可能枚数を表示する。また、第3の撮影可能枚数が第1の撮影可能枚数である時は、表示を点灯し、第3の撮影可能枚数が第2の撮影可能枚数である時は、表示を点滅する構成になっている。本実施例によるユーザが記録媒体9と電源12のどちらで撮影可能枚数が制限されているか知ることができ、必要に応じて記録媒体9と電源12のどちらか適切な方を交換することができる。

【0056】(実施例3) 実施例3において、図9中の符号56は、三桁のセブンセグメント素子から成る撮影可能枚数表示で、通常は前述のフローチャートで説明した第1の撮影可能枚数を表示する。そして、ユーザがSW3を形成する電源容量検出スイッチ24を操作し、電源容量を確認した時には、前記図6に示すフローチャートに従って第2の撮影可能枚数を一定時間表示し、その後再び第1の撮影可能枚数を表示する。本実施例によると、ユーザは必要に応じて第1の撮影可能枚数と第2の撮影可能枚数を知ることができ。

【0057】以上実施例2、3の表示手段は、実施例1の表示手段に比べて小さく、カメラ全体を小型化することができ。

【0058】また、付け加えることすれば、従来のデジタルカメラで、各々のモードに対応して前述の記録モードが指定される複数の撮影モードを設け、前記設定手段21は前記複数の撮影モードの中から実際に撮影に用いる一つの撮影モード及びそれに対応する1枚当たりの情報量と同時に設定する撮影モード設定手段で構成しても良い。

【0059】

【発明の効果】請求項1の発明によるデジタルカメラにおいて、電源の容量を検出する電源容量検出手段と、記録媒体の残り容量を検出する記録媒体容量検出手段と、撮影画像1枚当たりの情報量を設定する設定手段と、記録媒体容量検出手段で検出した記録媒体の残り容量と記録

定手段が設定した撮影画像1枚当たりの情報量から記録媒体に記録可能な第1の撮影可能枚数を算出する第1の撮影可能枚数算出手段と、前記電源容量検出手段が検出した電源の容量、及び前記設定手段が設定した撮影画像1枚当たりの情報量より求めらるる第2の撮影可能枚数算出手段と、同一電源で撮影できる第2の撮影可能枚数を算出する第2の撮影可能枚数算出手段と、前記第1の撮影可能枚数及び第2の撮影可能枚数の内、少なくとも一方を表示する表示手段とを設けたこと。

【0060】請求項2の発明によるデジタルカメラにおいて、前記第1の撮影可能枚数と第2の撮影可能枚数を比較し、少ない方を第3の撮影可能枚数とし、第3の撮影可能枚数を表示する表示手段とを設けたこと。

【0061】請求項3の発明によるデジタルカメラにおいて、前記第3の撮影可能枚数が、前記第1の撮影可能枚数である場合と、前記第3の撮影可能枚数が、前記第2の撮影可能枚数である場合とで、表示を区別して異なる表示形態としたこと。

【0062】請求項4の発明によるデジタルカメラにおいて、電源容量検出手段は、電源の容量検出を示す指示手段を有し、表示手段の表示内容は通常は第1の撮影可能枚数を表示し、前記指示手段が操作された時に、電源容量検出手段が電源の容量を検出すると共に、第2の撮影可能枚数算出手段が第2の撮影可能枚数を算出し、該第2の撮影可能枚数を前記表示手段に一定時間表示すること。

【0063】等の構成により、記録媒体の残容量と電池の残容量から決まる実際の撮影可能枚数を正確にユーザに知らせる効果がある。

【0064】また、請求項5の発明において、該カメラに装着されている記録媒体の種類を検出する記録媒体種類検出手段と、該記録媒体種類検出手段の検出結果を表示する表示手段とを有すること。

【0065】請求項6の発明において、前記表示手段は、メイン電源スイッチがオフの時でも、前記記録媒体種類検出手段の検出結果を表示すること。

【0066】請求項7の発明において、前記記録媒体種類検出手段は、前記メイン電源スイッチがオフの時に記録媒体を変更した場合には、この記録媒体の種類を検出し、前記表示手段が前記記録媒体種類検出手段の検出結果を表示すること。

【0067】等により、ユーザがカメラに装着されている記録媒体の種類を容易に確認することが出来、ユーザ自身の望む撮影ができる効果がある。

【0068】また、請求項8の発明において、撮影画像1枚当たりの記録情報量が異なる複数の記録モードを有し、該記録モードを設定する設定手段と、記録媒体の残り容量を検出する記録媒体容量検出手段と、該記録媒体容量検出手段が検出した記録媒体の残り容量及び設定手段で検出した記録媒体の残り容量と記

影可能枚数を算出する撮影可能枚数算出手段と、前記撮影可能枚数を表示する表示手段とを備えるデジタルカメラにおいて、前記設定手段はメイン電源スイッチがオフの時も、記録モードを設定することが可能であり、メイン電源スイッチがオフの時に前記設定手段により記録モードが設定された時は、前記撮影可能枚数算出手段が撮影可能枚数を算出し、前記表示手段が前記撮影可能枚数を表示すること。

【0069】請求項9の発明において、前記設定手段は、前記記録モードを規定する複数の撮影モードの中から撮影に用いる一つの撮影モード及びそれに対応する記録モードを同時に設定する撮影モード設定手段であること。

【0070】等により、表示手段を小さくできることとカメラ全体を小型化できるといふ効果を呈する。

【図面の簡単な説明】

【図1】 本発明に係るデジタルカメラの裏面構成例を示すブロック図

【図2】 本実施例におけるデジタルカメラの表示パネルのフローチャート

【図3】 本実施例におけるデジタルカメラの撮影シーケンスのフローチャート

【図4】 本実施例における設定手段を用いて撮影画像1枚当たりの情報量を設定、または設定変更する時の手順を示すフローチャート

【図5】 本実施例において記録媒体を変更する時の手順を示すフローチャート

【図6】 本実施例において電源容量検出スイッチを操

作し、電源容量を確認する時の手順を示すフローチャート

【図7】 セグメント表示例を示す説明図

【図8】 電源容量表示例を示す説明図

【図9】 その他の実施例におけるセグメント表示例を示す説明図

【符号の説明】

1 デジタルカメラ全体を制御するCPU

2 撮影レンズ

3 レンズ駆動装置

4 シャッター

5 シャッターチャージ機構

7 光電変換素子

8 画像処理手段

9 記録媒体

10 記録手段

12 電源

15 撮影制御動作開始スイッチSW1

16 レリーズスイッチSW2

17 表示手段

18 電源容量検出手段

19 記録媒体容量検出手段

20 記録媒体種類検出手段

21 設定手段

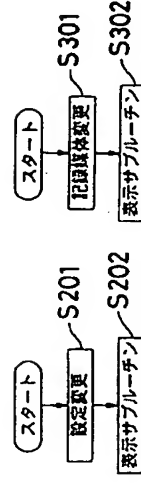
22 第1の撮影可能枚数算出手段

23 第2の撮影可能枚数算出手段

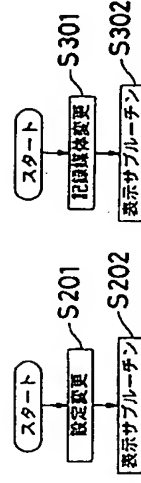
24 電源容量検出スイッチSW3

25 メイン電源スイッチSW4

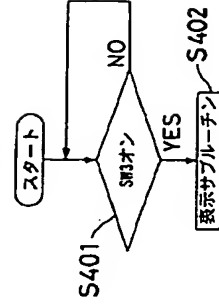
【図4】



【図5】



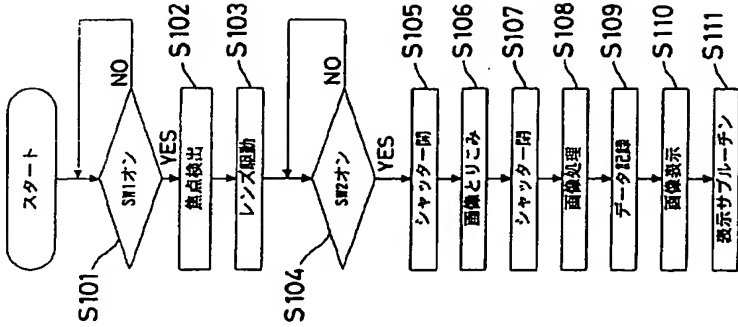
【図6】



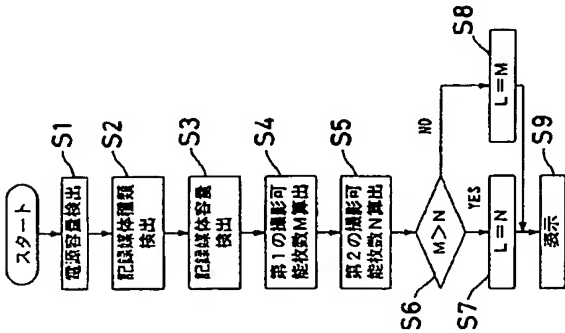
【図8】



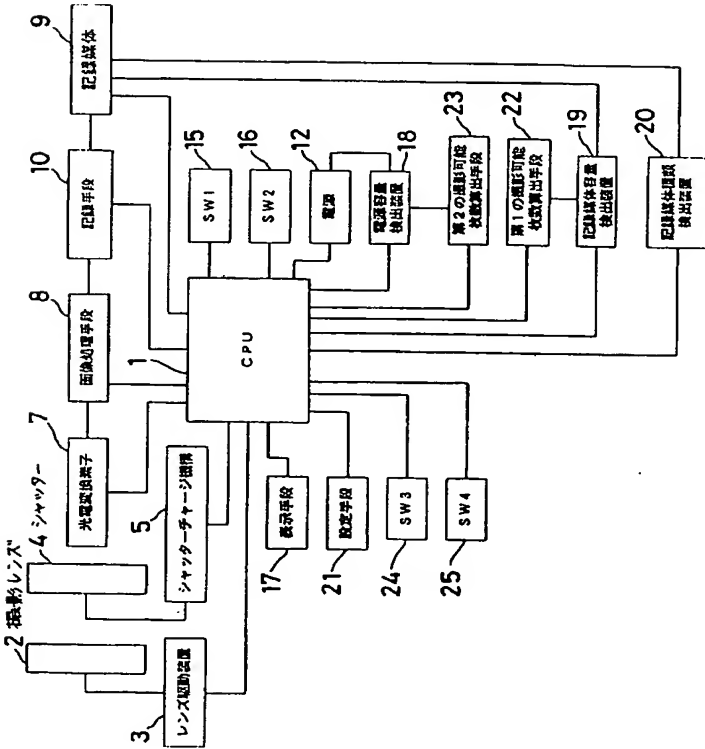
【図3】



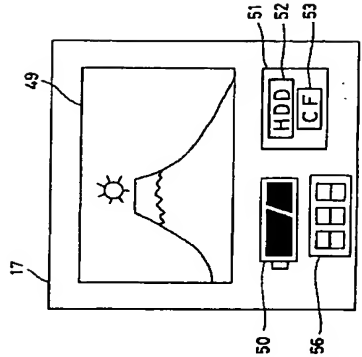
【図2】



【図1】



【図9】



【図7】

